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Central Valley Region
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28 August 2000

Mr. Warner Phillips, Assistant Director
Butte County Department of Public Works
7 County Center Drive
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NOTICE OF NONCOMPLIANCE, NEAL ROAD LANDFILL, CHICO, BUTTE COUNTY

We have reviewed a report entitled *Annual 2000 Groundwater and Soil-Pore Liquid Monitoring Report, Butte County Neal Road Sanitary Landfill* dated 14 July 2000 that was prepared by your environmental consultant Kennedy/Jenks Consultants.

We are concerned regarding inorganic monitoring parameter concentrations shown in Figures 5 through 9. These plots show overall increases of specific conductance, total dissolved solids, chloride, sulfate, and nitrate over time. We are also concerned regarding recent volatile organic compound detections shown in Table 6. These trends indicate impacts to the water table.

Inorganic Monitoring Parameters

The 14 July 2000 report presents upper tolerance limits for inorganic groundwater monitoring parameters as individual well assessments and in terms of California Department of Health Services Maximum Contaminant Levels (DHS-MCLs) under "Summary of Groundwater Quality." However the use of upper tolerance limits to assess individual monitoring wells does not address statistical significance as required in *Title 40, Code of Federal Regulations, 258 Subtitle D* (Subtitle D) *Section 258.53*, and *Title 27, California Code of Regulations* (Title 27) *Section 20385*. Any statistically significant increase in an inorganic monitoring parameter constitutes a release according to the regulations. DHS-MCLs are not appropriate benchmarks for detection monitoring.

Statistically significant increases may be determined for inorganic monitoring parameters at the Neal Road Landfill using inter-well and intra-well statistical techniques. Inter-well techniques such as analysis of variance (ANOVA) are appropriate if a difference in water quality between the up-gradient (background) monitoring well and down-gradient wells are assumed to be due to releases from the landfill.

In some instances, natural fluctuations of inorganic parameters may be occurring across the entire site unrelated to releases from the landfill. In such cases, intra-well statistics may be appropriate to assess the significance of a parameter increase within any particular well over time. However an assessment in detail of background groundwater quality would be required to adequately demonstrate that elevated

inorganic parameters in down-gradient wells are due to natural fluctuations (e.g., multiple up-gradient monitoring wells).

A preliminary statistical analysis was done on specific conductance data with the Sanitas ™ software package using MW-4 as the up-gradient well to assess the applicability of inter-well techniques. A non-parametric ANOVA was used because the data do not follow a normal distribution curve. Data were divided at 28 August 1996 to evaluate the effect of the plastic cover on the unlined portion of the landfill. Results indicate statistically significant differences between monitoring well MW-4 and down-gradient wells especially *after* 28 August 1996. The following tables summarize the statistics from 2 June 1989 through 28 August 1996, and from 28 August 1996 through 1 June 2000. (Data from 28 August 2000 were used in both analyses.)

Specific Conductance Statistics
2 June 1989 through 28 August 1996
(data in µmhos/cm)

Monitoring Well	MW-4	MW-3	MW-2	MW-1	MW-6	MW-7
Relative Position of Well	Up-gradient	~2900 feet south of MW-4	~3700 feet south-southwest of MW-4	~3900 feet south-southwest of MW-4	~4000 feet south-southwest of MW-4	~4400 feet south-southwest of MW-4
Minimum	*133*	163	127	172	160	No data
Maximum	*298*	490	360	404	470	No data
Mean	*220*	300	213	260	269	No data
Median	*222*	294	211	257	260	No data
Statistical Significance?		Yes	No	Yes	No	No data

Specific Conductance Statistics
28 August 1986 through 1 June 2000
(data in µmhos/cm)

Monitoring Well	MW-4	MW-3	MW-2	MW-1	MW-6	MW-7
Minimum	*180*	350	270	280	260	230
Maximum	*249*	776	482	350	484	320
Mean	*211*	586	363	317	393	286
Median	*212*	618	382	319	408	292
Statistical Significance?		Yes	Yes	Yes	Yes	No

Two statistical outliers were removed by staff; from MW-4 on 14 November 1995 and MW-1 on 9 November 1993. Readings were 93 and 57 µmhos/cm respectively. These readings were less than 50% of their corresponding total dissolved solids readings. Total dissolved solids are typically approximately 60% of specific conductance. Therefore these readings are considered anomalous. Also the higher result was used when duplicate samples were reported. Data from former well MW-5 are not shown due to limited sampling interval.

Volatile Organic Compounds

The report also presents volatile organic compound data in Table 6. The detections post-dating 28

August 1996 are of concern. MW-1 contained 0.43 µg/L of toluene on 4 August 1997. MW-3 contained 0.71 and 0.77 µg/L of 1,4 dichlorobenzene on 10 March 1999 and 1 June 1999 respectively, and 1.1 µg/L dichlorodifluoromethane on 10 March 1999. Due to the increases of inorganic monitoring parameters we are concerned that volatile organic compound concentrations may also increase.

We request the County perform statistical comparisons of inorganic monitoring parameters between up-gradient monitoring well MW-4 and down-gradient wells and non-statistical methods on volatile organic compound detections, and develop an evaluation monitoring program as described in Title 27, Section 20385. These analyses are required to comply with Waste Discharge Requirements Order Number 88-190 and Regional Water Quality Control Board Order No. 93-200.

We also request an assessment in detail of the site hydrogeology sufficient to assess the effectiveness of the groundwater monitoring system. This assessment shall include but not be limited to water table maps with Stiff Diagrams at monitoring wells, and appropriate cross sections or fence diagrams. We request analyses of predicted migration, dispersion, and decay rates of constituents of concern, and potential impacts to all identified sensitive receptors within one mile of the site. We further request sampling of the landfill water supply well and the off-site chicken ranch well, and analyses for all inorganic and organic monitoring parameters and constituents of concern.

Please provide a Revised Report of Waste Discharge with a Corrective Action Plan as required in Title 27 and a Water Quality Protection Standard Report as required in Order Number 93-200. These should include statistical and non-statistical analyses of all monitoring and supply well data, a detailed hydrogeological assessment, an evaluation of the current monitoring well network, and further recommended corrective measures (e.g., further monitoring wells, modifications to interim and final cover, etc.) by **13 November 2000**. Prior to implementation of an appropriate corrective measure, a public meeting will be required pursuant to Subtitle D Section 258.56.

You may contact me at (530) 224-4998 or at the letterhead address with questions or comments.

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cc: Curt Griffiths, Kennedy/Jenks